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TM-(L)-715/019/01

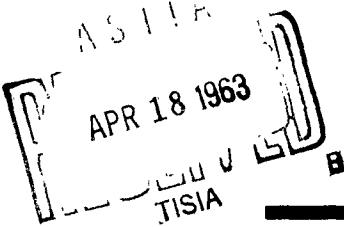
# TECHNICAL MEMORANDUM

(TM Series)

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Utility Program Descriptions	SYSTEM
Milestone 11	DEVELOPMENT
Symbolic Dump Routine (SYMDUMP)	CORPORATION
By	
F. J. LaChapelle	2500 COLORADO AVE.
R. L. Kinkead	SANTA MONICA
14 March 1963	CALIFORNIA
Approved	
J. B. Munson	

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#### SUBROUTINE IDENTIFICATION

- A. Title: Symbolic Dump Routine (SYMDUMP) - Ident A48, Mod AB
- B. Programmed and Documented: 14 July 1962  
F. J. LaChapelle, System Development Corporation
- C. Revised: 14 February 1963, documented: 14 March 1963  
R. L. Kinkead, System Development Corporation

#### PURPOSE

To provide octal, symbolic, floating point decimal, or BCD dumps of COP11 routines using their names to define the areas in core to be dumped.

#### USAGE

##### A. Calling Sequence

L	RTJ	SYMDUMP
L+1	Normal Return	
ZRO	N	
L+2	BCD	1XXXXXXXXX
L+3	DEC	T
L+4	BCD	1PROG1
L+5	BCD	1PROG2
.	.	.
.	.	.
.	.	.
L+K	BCD	1PROG(LAST)

Where:

N = the total number of parameters

T = the logical tape or printer to write dump on (2 ≤ T ≤ 13).

PROG1 ... PROG(LAST) = the names of the specific routines to dump  
(left adjusted with trailing blanks).

B. The Parameter XXXXXXXX is optional and if it is present, the result will be that the routines will be dumped in the specified format. The possible values of XXXXXXXX are:

1. SYMBOLIC - mnemonic format
2. FLOATDEC - floating point decimal format, and
3. BCD - BCD format.

If absent, the dump will be in octal.

C. When called by a function card:

\* SYMDUMP XXXXXXXX T PROG1 ... PROG(LAST)

where all parameters are defined as above with XXXXXXXX again optional.

#### RESTRICTIONS

- A. SYMDUMP uses the TTTT table, LCOUNT, LINFO, and LNAMES.
- B. SYMDUMP uses the subroutine CORE, (TM-(L)-715/016/001A).
- C. A page eject follows the dump of each program and no end of file is written following a dump.
- D. A maximum of twenty routines may be dumped with one call to SYMDUMP.
- E. Only those routines defined previously by a DEFINES card or those routines which have been loaded by MTCII at execution time may be dumped by SYMDUMP.
- F. It is possible to call six selected areas of core by six special names. These areas and their mnemonics are: COMMON ( $06743_8$  -  $07106_8$ ), POOL ( $04700_8$  -  $07106_8$ ), COP ( $00000_8$  -  $07777_8$  and  $70000_8$  -  $77777_8$ ), ZEROTEN ( $00000_8$  -  $00010_8$ ), INOUT ( $00000_8$  -  $077777_8$ ), and ALLCOP ( $00000_8$  -  $077777_8$  and  $70000_8$  -  $777777_8$ ). Note that COP and ALLCOP are

the same areas and consist of two separate parts. INOUT is everything below  $10000_8$  since the I/O routines and buffers are scattered throughout this area.

- G. If a routine is requested which is not a special name or has not been loaded or defined, a one-line record to this effect is written on the output tape. The normal dumping of the remaining routines then resumes.
- H. If an absolute program is requested, a dump beginning with the first cell of the program and extending through  $76432_8$  is made.
- I. If the logical tape is illegal, a normal return is made with no error message.
- J. Output is called into core by CORE using the ADDROF feature in MTCII if FLOATDEC or BCD formats are selected.

#### TIMING

SYMDUMP takes a maximum of one minute to dump "32K" core.

#### STORAGE

$233_8$  cells total.

$121_8$  cells are instruction cells.

$15_8$  cells for a table defining the special areas of core.

$25_8$  cells contain messages.

$15_8$  cells are constants.

$33_8$  cells are temporary storage.

#### VALIDATION TESTS

SYMDUMP was tested by the use of function cards. It was tested for dumping defined routines, routines called from the master tape, and the special areas of core (in all of the possible formats). Tests were made which printed on tape and the on-line printer. Multiple dumps were tested, as

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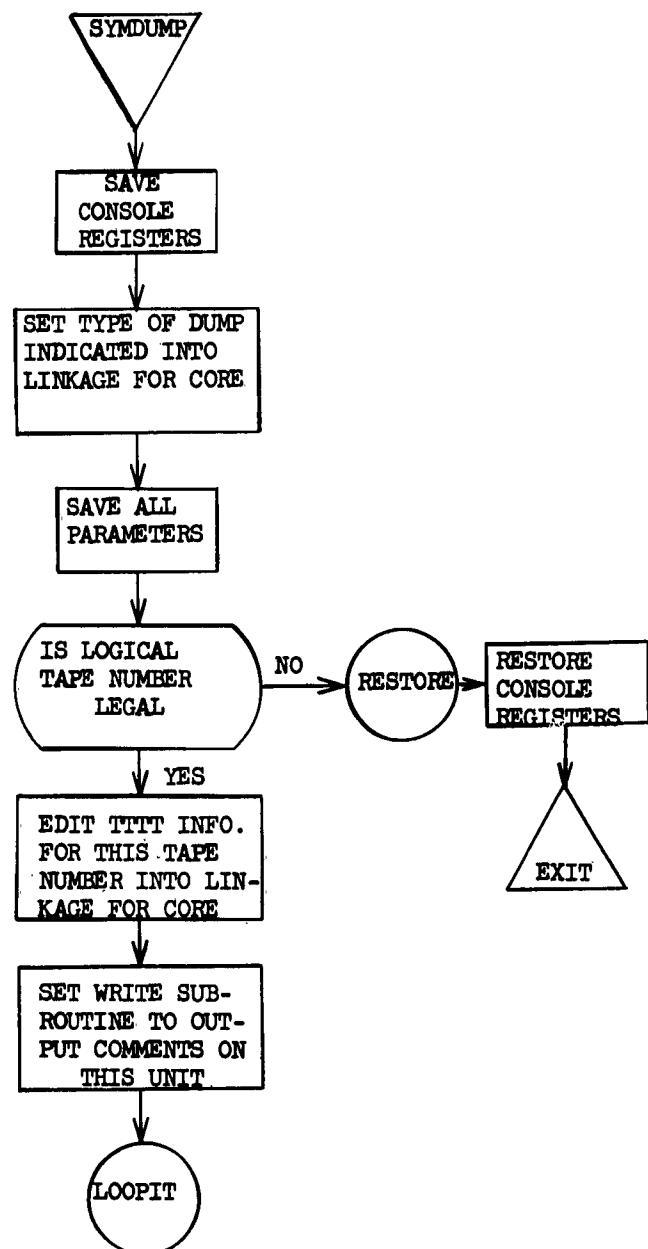
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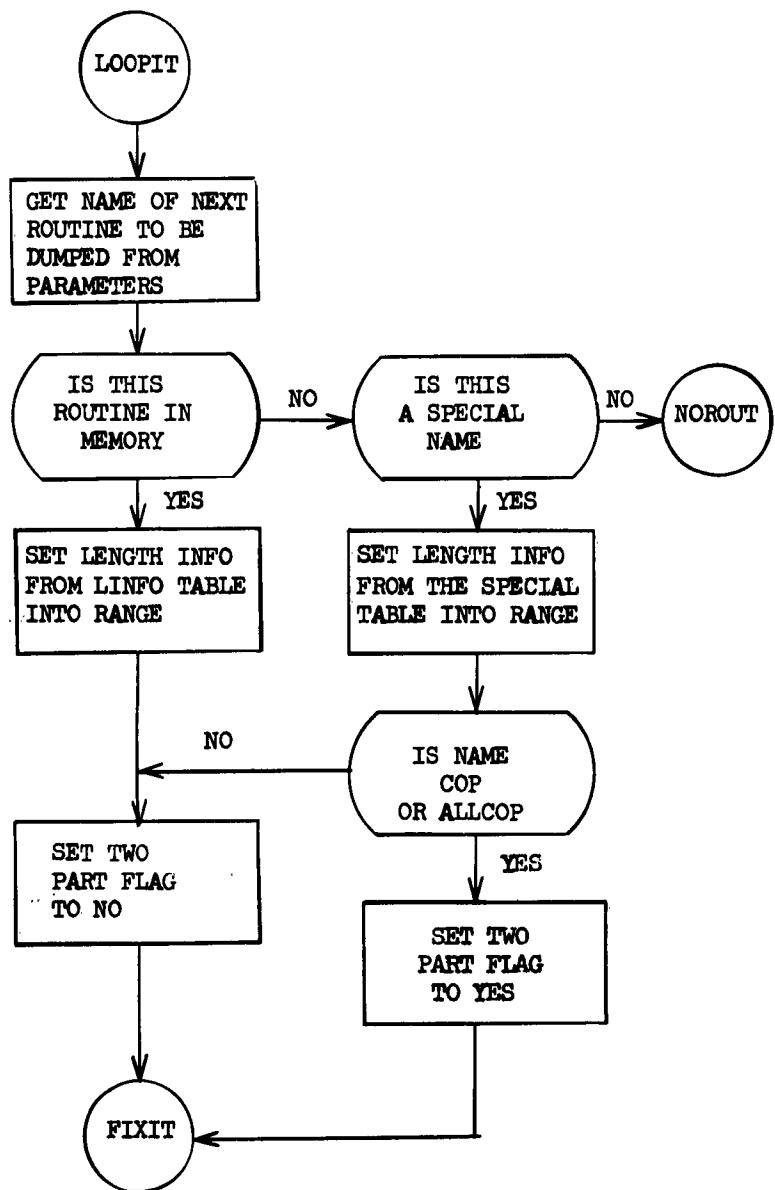
was SYMDUMP's response to illegal tape numbers and to subroutines not in core.

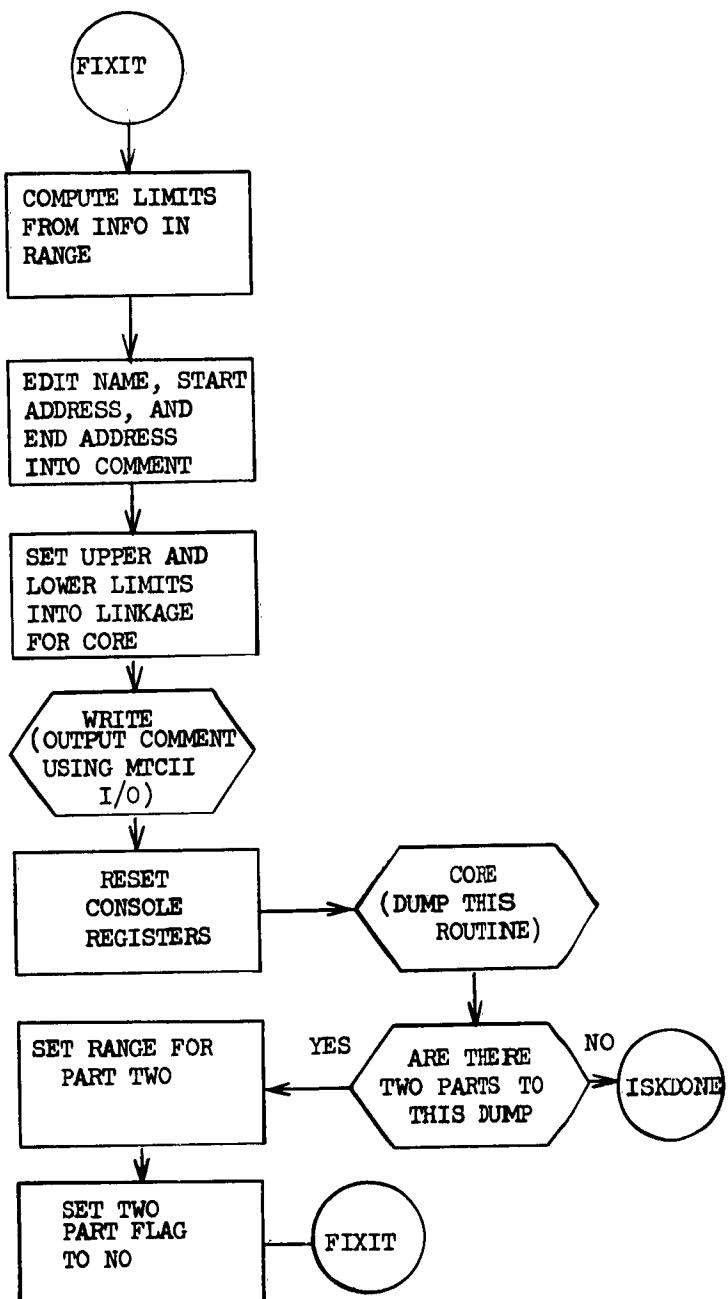
See Appendix A for the function card inputs and the dump results of these tests.

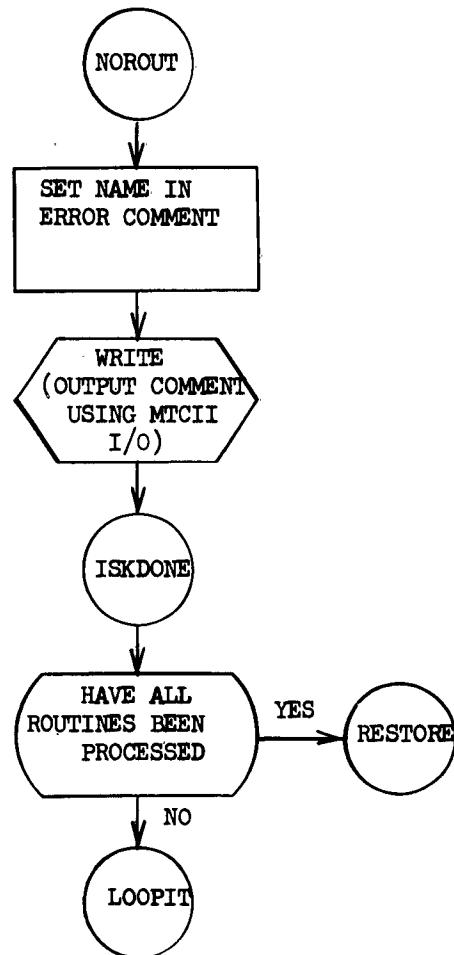
REFERENCES

- A. "1604 Systems Manual", Lockheed Missiles and Space Division LMSC - 44758, 1 January 1962, P. 50.12.01.
- B. Computer Program Library Catalog No. 75048.









\*CLR  
 \*GARDS  
 DEFINES ALPHA 100  
 \* 4 SYNDUMP 13 S14 ALPHA ;USUCH :XP

STORAGE ANALYSIS  
 (o = RELOCATABLE N = NEWLY DEFINED R = REDEFINITION)

NAME	ADDRESS	NAME	ADDRESS	NAME	ADDRESS
CIRE	* 10251	SIN	* 11272	UPACK	* 11242
FLORAIN	* 11254	SIN	* 10164	SIN	* 10100
N	* 10640				

\*SYNDUMP SYMBOLIC 4 SIN ZEROFN  
 \*SYNDUMP FLOATDC 13 EXP  
 \*SYNDUMP INCD 4 ALPHA NORUM

DUMP OF THE SIN  
 ACUMULATOR

ROUTINE	RANGE IS FROM	10100	TO	10164		
0-RECLISTEN	I-1	I-2	I-3	I-4	I-5	I-6
5165664746464320	0000000000000000	00251	76432	00771	00000	00000
10100	75 0 77777	56 1 10153	42 0 10336	20 0 10153	22 2 10103	42 0 10136
10104	45 0 10137	75 6 10107	51 1 00001	57 1 10133	65 0 10140	75 0 10110
10110	64 0 77775	21 0 10154	75 4 11242	50 0 00000	50 1 00003	22 2 10134
10114	10 0 00000	03 0 77777	27 0 10142	42 0 10136	36 0 10153	14 0 10154
10120	61 0 10121	44 0 10146	22 0 10133	75 0 77777	15 0 10142	75 0 10125
10124	15 0 10142	42 0 10136	20 0 10153	26 0 10153	20 0 10152	26 0 10144
10130	55 1 10127	14 0 10145	26 0 10153	03 0 0004	75 4 11254	50 0 00000
10134	60 0 10135	10 0 00000	07 0 77777	75 0 10115	77 7 77777	20 5 77777
10140	17 3 24000	00 0 00000	20 0 14000	00 0 00000	31 1 03755	24 2 10242
10144	77 7 77777	63 1 36752	00 0 17777	77 7 7775	77 7 65252	52 5 23746
10150	77 7 77627	76 4 12520	00 0 00005	61 3 27443	00 0 00000	00 0 00000
10154	*****	00 0 00000	00 0 00000	00 0 00000	*****	00 0 00000
10164	75 0 77777	56 1 10225	65 0 10230	75 0 10164	52 1 10164	65 0 10231

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DUMP OF THE ALPHA ACCUMLATOR		ROUTINE.	RANGE IS FROM	10000	10	10100	1-1	1-2	1-3	1-4	1-5	1-6
		0-REGISTER					00251	76432	00771	00000	00000	
10000	61 6 26364	65 6 66770	71 4 14443	44 4 54647	50 5 12223	24 2 52627	50 3 11201	02 0 30405				
10004	66 0 71011	14 3 45474	13 3 35573	40 2 16020	20 2 06162	63 6 46566	67 7 05162	63 6 46566				
10010	*****	61 6 26364	65 6 66770	*****								
10020	50 0 10100	50 0 10164	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	
10024	*****	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	
10074	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	
10100	75 0 77777	56 1 10133	42 0 10136	20 0 10153	22 2 10103	42 0 10136	52 1 10100	57 1 10133				

THE ROUTINE NO SUCH IS NOT IN CORE. CHECK YOUR FUNCTION CARD FOR AN ERROR.

DUMP OF THE EXP ACCUMLATOR		ROUTINE.	RANGE IS FROM	10164	10	10251	1-1	1-2	1-3	1-4	1-5	1-6
		0-REGISTER					00251	76432	00771	00000	00000	
10164	75 0 77777	56 1 10225	65 0 10230	75 0 10164	52 1 10164	51 1 00001	65 0 10231	75 0 10172				
10170	57 1 10171	52 1 10225	10 0 00000	75 0 77777	75 4 11242	50 0 00000	22 2 10177	42 0 10232				
10174	60 0 10176	10 0 00000	23 2 10176	10 0 77777	02 0 77777	75 0 10232	60 0 10201	10 0 00000				
10200	23 2 10241	10 0 77777	07 0 77777	50 0 00000	27 0 10233	20 0 10245	44 0 10232	01 0 00002				
10204	20 0 10246	24 0 10246	20 0 10247	14 0 10234	20 0 10244	12 0 10235	27 0 10244	14 0 10236				
10210	26 0 10247	07 0 00004	14 0 10237	15 0 10246	20 0 10244	12 0 10246	27 0 10244	14 0 10240				
10214	57 1 10225	34 1 00057	20 0 10247	12 0 10245	03 0 00001	22 2 10236	23 3 10227	11 0 7776				
10220	11 1 77721	50 1 00000	16 0 10247	06 0 00001	03 0 00014	44 0 10232	41 0 10241	42 0 10240				
10224	55 1 10225	32 2 10242	50 1 77777	75 0 77777	23 2 10227	75 0 10220	11 1 77721	75 0 10221				
10230	20 1 25424	26 0 02400	57 6 52353	51 7 75377	77 7 77777	77 7 77777	05 4 27102	77 5 75166				
10234	25 0 03355	62 1 15462	01 1 63465	11 6 22313	00 6 31225	67 4 33651	10 0 00000	00 0 00141				
10240	20 0 00000	00 0 00000	40 0 00000	00 0 00000	20 0 15220	23 6 31477	00 0 00000	00 0 00000				
10244	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000				
10250	00 0 00000	00 0 00000	75 0 11372	75 0 10225	20 0 11164	75 4 10653	10 0 77776	20 0 11012				

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DUMP OF THF SIN	ROUTINE.	RANGE IS FROM	TO	10100	TO	10164
ACCUMULATOR	Q=REGISTER	1=1	1=2	1=3	1=4	1=5
5165664746464320	0000000000000000	00000	00251	76432	00771	00000
10100 SLJ 77777 SIU 1 10133	SCM 10136 STA 10153 AJP P 10103 SCH	10136	10140	SLJ 10110	LAC 10153	SLJ 10133
10104 T+5 10137 SLJ 10107	INJ 1 00001 SIL 1 10133 TJS	10133	10140	SLJ 10110	LAC 10153	SLJ 10133
10110 ENQ 77775 ST0 10154	RTJ 11242 NOP 00000	ENI 1 00003 AJP P 10134	SCH 10136	SAL 10134		
10114 ENA 00000 LRS 77777	DVF 10142 SCM 10136 SSK 10153 ADD	10154	10154	SST 10143	INA 10125	
10120 SAL 10121 LDL 10136	AJP Z 10133 SLJ 77777 SHB 10142	SLJ 10125	10142	SLJ 10136	SLJ 10125	
10124 S1B 10142 SCM 10136	STA 10153 MUF 10153 STA 10152 MUF	10144	10152	ADD 1 10146	MUF 10152	
10130 IJP 1 10127 ADD 10145	MUF 10153 LRS 00044 RTJ 11254 NOP	00000	11254	ENI 1 77777	SLJ 77777	
10134 SAU 10135 ENA 00000	LLS 77777 SLJ 10115 SEV 7 77777	SEV 7 77777	7 77777	STA 5 77777	SEV 7 77777	
10140 LOC 3 24600 ZR0 00000	STA 14000 ZR0 00000	FSB 1 03755	MUI 2 10242	SEV 7 77777	SEV 7 77774	
10144 SEV 7 77777 OUT 1 36752	ZR0 17777 SEV 7 77775	SEV 7 65252	LIU 5 25746	ZR0 02104	ST0 26751	
10150 SEV 7 77627 SRJ 12550	ZR0 00005 SAL 3 27443 ZRG 00000	ZRG 00000	ZRG 00000	ZRD 00000	ZRD 00000	
10154 *****	ZR0 00000 ZR0 00000	*****	*****	*****	*****	
10164 SLJ 77777 SIU 1 10225	TJS 10230 SLJ 10164 LIU 1 10164 INI 1 00001	TJS 10231	SLJ 10172			

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DUMP OF THE ZEROTEN	ROUTINE.	RANGE IS FROM	TO	00000	TO	00011
ACCUMULATOR	Q=REGISTER	1=1	1=2	1=3	1=4	1=5
5165664746464320	0000000000000000	00000	00251	76432	00771	00000
00000 SFL 32005 SEN 32000	ZR0 01604 ZR0 01604 ENI 3 01325 SLJ 01125	01325	ZR0 02356	ZR0 02356		
00004 LLS 11224 OLS 11242	LLS 00014 SAU 00006 ACT 3 00250 SLJ 00034	00034	SLJ 04141	SLJ 04141		
00010 ENI 3 00003 SIL 00003	ACT 3 00000 SLJ 00044 ACT 3 00002 SEN 32000	32000	ENI 1 07717	ENQ 00000		

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DUUMP OF THE EXP	ROUTINE,	RANGE IS FROM	10164	10	10251	1-6
ACCUMULATOR	0-REGISTER	1-1	1-2	1-3	1-4	1-5
51656547466464320	0000000000000000	00000	00251	76432	00771	00000
51656547466464320	75077772561101225	-225342629 -96		-373827614113		-225265479 -96
010164						
010170	-174793390 +17	1000000075077777	*,339542665-260			2221017742010232
010174	-484603682 +0	2321017610077777	.484572660-267			-484237671 +0
010200	23210201310077777	+103495794-170	2701023320010245			-3735328282+231
010204	2001024626010246	2001024714010234	2001024412010235			2701024414010236
010210	2601024707000004	1401023715010246	2001024412010246			2701024414010240
010214	-17357564 +17	2001024712010245	0300000122210226			2331022711077776
010220	-391449906-130	1601024406000001	030000144010232			-214024847+289
010224	-590638373 +55	501777775077777	2321022775010220			.69152762+130
010230	-709085957 +3	-709085957 +3	-0			.363901890-201
010234	2500135552115462	011634451122313	0063122567433611			1000000000000141
010240	2000000000000000	-8989846567+308	.141421356 +1			0
010244	0	0	0			0

JUMP OF THE ALPHA ACCUMULATOR		ROUTINE	RANGE IS F#NM	10000	T0	10100	
51656674464320		0-REGISTER	1-1	1-2	1-3	1-4	1-5
00000	ABCDEF	00000000000000	00000	00251	76432	00771	00000
00004	6789#(*	JKLMNOP	QRSTUVWXYZ		Y7012345		
00110		*,*,*,*,*	ABCDEFGHI		GHABCD <sup>E</sup>		
00220		*****	ABCDEFGHI		*****		
00224		*****			*****		
0074		*****			*****		

THE ROUTINE `NOSUCH` IS NOT IN CORE. CHECK YOUR FUNCTION CARD FOR AN ERROR.

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System Development Corporation,  
Santa Monica, California  
UTILITY PROGRAM DESCRIPTIONS  
MILESTONE 11 SYMBOLIC DUMP ROUTINE  
(SYMDUMP)  
Scientific rept., TM(L)-715/019/01,  
by F. J. LaChapelle, R. L. Kinkead.  
14 March 1963, 12p., 2 refs.  
(Contract AF 19(628)-1648, Space  
Systems Division Program, for Space  
Systems Division, AFSC)

Unclassified report

DESCRIPTORS: Programming (Computers).  
Satellite Networks.

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States that the Symbolic Dump  
Routine (SYMDUMP) provides octal,  
symbolic, floating point decimal,  
or BCD dumps of COPII (Control for  
Operational Programs) routines using  
their names to define the areas in  
core to be dumped.

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